



Operating Instruction

VM125-ex



THE STRONGEST LINK.

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1 General information

1.1 Manufacturer

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1.2 Legal notice

1.2.1 Trademark

The terms and names used in this document are registered trademarks and / or products of the companies in question.

1.2.2 Disclaimer

- All rights reserved.
- This document may not be reproduced in whole or in part except with the written consent of the publisher.
- This document may be subject to change without notice.

Any warranty claims are limited to the right to demand amendments. Liability for any damage that might result from the contents of these instructions or all other documentation is limited to clear cases of premeditation.

We reserve the right to amend our products and their specifications at any time, provided it is in the interest of technical progress. The information in the current manual (online or on CD / DVD / USB-stick) or in the operating instructions included in the delivery applies.

1.3 About these Operating Instructions

All data relevant to explosion protection from the EC-type examination certificate were copied into these operating instructions.

1.3.1 Target group

These operating instructions are intended for the following groups of people:

- Project engineers
- Electricians and fitters
- Operators
- Operating staff
- Maintenance staff

1.3.2 How to use this manual

- Read these operating instructions, especially the safety notes, carefully before use.
- Take note of all other applicable documents (see also chapter [1.4 Further documents](#)).
- Keep the operating instructions throughout the service life of the device.
- Make the operating instructions accessible to operating and maintenance staff at all times.
- Pass the operating instructions on to each subsequent owner or user of the device.
- Update the operating instructions every time R. STAHL issues an amendment.

1.3.3 Application

Operating Instructions 01.02.00
version:

The following operating instructions apply to the following systems:

Supply module VM125-ex

The original instructions are the German edition.
They are legally binding in all legal affairs.

1.4 Further documents

- Certificate compilation VM125-ex (CE_VM125-ex)
- Operating Instruction barcode scanner (OI_Scanner_IDM)
- Certificate compilation scanner (CE_IDM)



For documents in other languages see [r-stahl.com](https://www.r-stahl.com).

1.5 Conformity with standards and regulations

1.5.1 Certificates

	Certificates: r-stahl.com The device has IECEx approval. See IECEx homepage: https://www.iecex-certs.com/#/home .
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1.5.2 Approvals

The following approvals are valid for all devices:

Synonym	Scope of validity	Valid until	Certificate number
CE / ATEX	Europe	unlimited	IBExU16ATEX1004
IECEX	Global	unlimited	IECEX IBE 16.0004

1.5.3 Summary of applied standards

1.5.3.1 ATEX directive 2014/34/EU

Standard	Classification
IEC 60079-0 : 2018	General requirements
IEC 60079-5 : 2015	Protection by powder filling "q"
IEC 60079-7 : 2015 + A1 : 2018	Protection by increased safety "e"
IEC 60079-11 : 2012	Protection by intrinsic safety "i"
IEC 60079-31 : 2014	Protected by enclosures "t" (dust)

1.5.3.2 EMC directive 2014/30/EU

Standard	Classification
EN 61000-6-2 : 2019	Immunity
EN 61000-6-4 : 2020	Emission

1.5.3.3 Low voltage directive 2014/35/EU

Standard	Classification
EN 61010-1 : 2010 + A1 : 2019 + A1 : 2019/AC : 2019	Audio / video, information and communication technology equipment – safety requirements

1.5.3.4 RoHS directive 2011/65/EU

Standard	Classification
EN IEC 63000 : 2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

2 Explanation of symbols

2.1 Symbols used in these Operating Instructions

Symbol	Meaning
	Useful hint for making work easier, important note
	Reference to another chapter, another section, another documentation or a web page.

2.2 Warning notes

	Hazardous situation which can result in fatal or severe, life-changing injuries if the safety measures are not complied with.
	Hazardous situation which can result in severe injuries if the safety measures are not complied with.
	Hazardous situation which can result in minor injuries if the safety measures are not complied with.
	Hazardous situation which can result in material damage if the safety measures are not complied with.

Symbol	Meaning
	Heat hazard

2.3 Symbols on the device

Symbol	Meaning
	Connection for equipotential bonding

3 Safety and security

The device has been manufactured according to the state of the art of technology while observing recognised safety-related rules. When using the device, it is nevertheless possible for hazards to occur to life and limb of the user or third parties or for the device, environment or material assets to be compromised.

Only use the device under the following conditions:

- If it is not damaged
- As intended, while remaining aware of safety and hazards
- In accordance with these Operating Instructions

3.1 Intended use



Without exception, all VM125-ex-* devices as well as the barcode scanners and base charging stations **must not** be operated in nuclear facilities !

The VM125-ex supply module is an intrinsically safe supply and barrier for use with IDM barcode scanners and charging stations. It can be installed directly in hazardous areas zone 1, 2 or 21, 22.

The permissible temperature range is between -25 °C and +60 °C.

"Intended use" includes complying with these Operating Instructions and the other applicable documents, such as the data sheet. All other uses are only considered to be intended after being approved by R. STAHL.

3.2 Predictable improper use

The device may only be installed and connected by specifically trained personnel.

3.3 Personnel qualification

Qualified specialist personnel is required to perform the activities described in these Operating Instructions. This primarily applies to work in the following areas:

- Product selection and project engineering
- Mounting / dismounting the device
- Installation
- Commissioning
- Maintenance, cleaning

Specialists who perform these tasks must have a level of knowledge that meets applicable national or equivalent country-specific standards and regulations. Additional knowledge is required for any activity in hazardous areas !

R. STAHL recommends having a level of knowledge equal to that described in the following standards:

- IEC/EN 60079-14 (Electrical installations design, selection and erection)
- IEC/EN 60079-17 (Electrical installations, inspections and maintenance)
- IEC/EN 60079-19 (Equipment repair, overhaul and reclamation)

3.4 Residual risks

3.4.1 Explosion hazard

Despite the device's state-of-the-art design, explosion hazards cannot be entirely eliminated in hazardous areas.

- Perform all work steps in hazardous areas with the utmost care at all times !

Possible hazards ("residual risks") can be categorised according to the following causes:

3.4.2 Mechanical damage

The device may become damaged during transport, mounting or commissioning. This kind of damage may, for example, render the device's explosion protection partially or completely ineffective. This may result in explosions causing serious or even fatal injury.

- Do not commission a damaged device and remove it immediately from the potentially explosive area.
- Only transport the device in special transport packaging that reliably protects the device from external influences. Observe the ambient conditions when selecting the transport packaging (see chapter [13.1 Technical data](#)).
- Check the packaging and the device for damage. Immediately report any damage to R. STAHL.
- Store the device ideally in its original packaging in a dry place (with no condensation), and make sure that it is stable and protected against the effects of vibrations and knocks.
- Do not damage the device or seals during its installation.
- Do not place any loads on the device.
- Switch off the device immediately if it can be assumed that the device can no longer be operated safely following harmful effects or in the event of general abnormalities (e.g. ingress of water, fluids, exposure to temperatures outside the specified range).

3.4.3 Excessive heat or electrostatic charge

- Operate the device only within the prescribed operating conditions (see chapter [4.5 Markings on the device](#) and chapter [13.1 Technical data](#)).
- Mount and install the device in such a way that it is always operated within the permissible temperature range.
- Regularly inspect the device for a material change. If you spot any changes, test or replace the device.

3.4.4 Improper mounting, installation, commissioning, maintenance or cleaning

Basic work such as installation, commissioning, maintenance or cleaning of the device must always be performed in accordance with the applicable national regulations of the country of use and only by qualified persons. Otherwise, the explosion protection may be rendered ineffective. This may result in explosions causing serious or even fatal injury.

- Have the assembly, installation, commissioning and maintenance work performed by qualified and authorised persons only (see chapter [3.3 Personnel qualification](#)).

- Observe the relevant installation and operating regulations for electrical systems (e.g. RL 99/92/EG, RL 2014/34/EU or the nationally applicable regulations, IEC/EN 60079-14 and the DIN VDE 0100 series).
- Observe general legal regulations or guidelines on occupational safety, accident prevention regulations and environmental protection laws, e.g. B. Ordinance on Industrial Safety and Health (BetrSichV).
- Do not open the enclosure.
- Do not open the terminal compartment in a potentially explosive atmosphere.
- Before commissioning, check the assembly for correctness (see chapter [7 Mounting and installation](#)).
- Operate the devices only when assembled.
- Use a back-up fuse with circuit breaker for the supply line.
- Before commissioning, make sure that the Ex e terminal compartment is completely closed and the flat seal has been properly screwed on.
- Do not make any changes to the device. Do not exchange or replace components. Explosion protection is no longer guaranteed for non-specified components.
- Do not insert any objects into the enclosure or other openings of the device. Do not block or cover openings on the device.
- Do not remove the breather.
- For outdoor use, install the VM125-ex-* in an appropriate enclosure with at least IP65 protection. Observe the relevant installation and operating regulations.

3.4.5 Electric shock

During operation and maintenance, high voltage is at times applied to the device. Because of this, the device must be de-energised during installation. Persons coming into contact with electrical lines carrying excessively high voltage can suffer severe electric shocks and, consequently, injuries.

- Only connect electrical circuits to existing terminals.

3.4.6 Device damage

As a result of unsuitable operating conditions or careless contact the device or individual components may be damaged so significantly that the device does not operate correctly or fails completely.

- Do not subject the device to external heat sources or direct sunshine. Ensure that the maximum ambient temperature is never exceeded.
- Do not open the enclosure. The enclosure has been sealed permanently.

4 Function and device design

4.1 Features and versions

The VM125-ex supply module is an intrinsically safe supply and barrier for use with IDM barcode scanners and charging stations. It can be installed directly in hazardous areas zone 1, 2 or 21, 22.

Various supply modules with different interfaces (RS-232 / 422 / USB) and voltage inputs (AC / DC) are available.

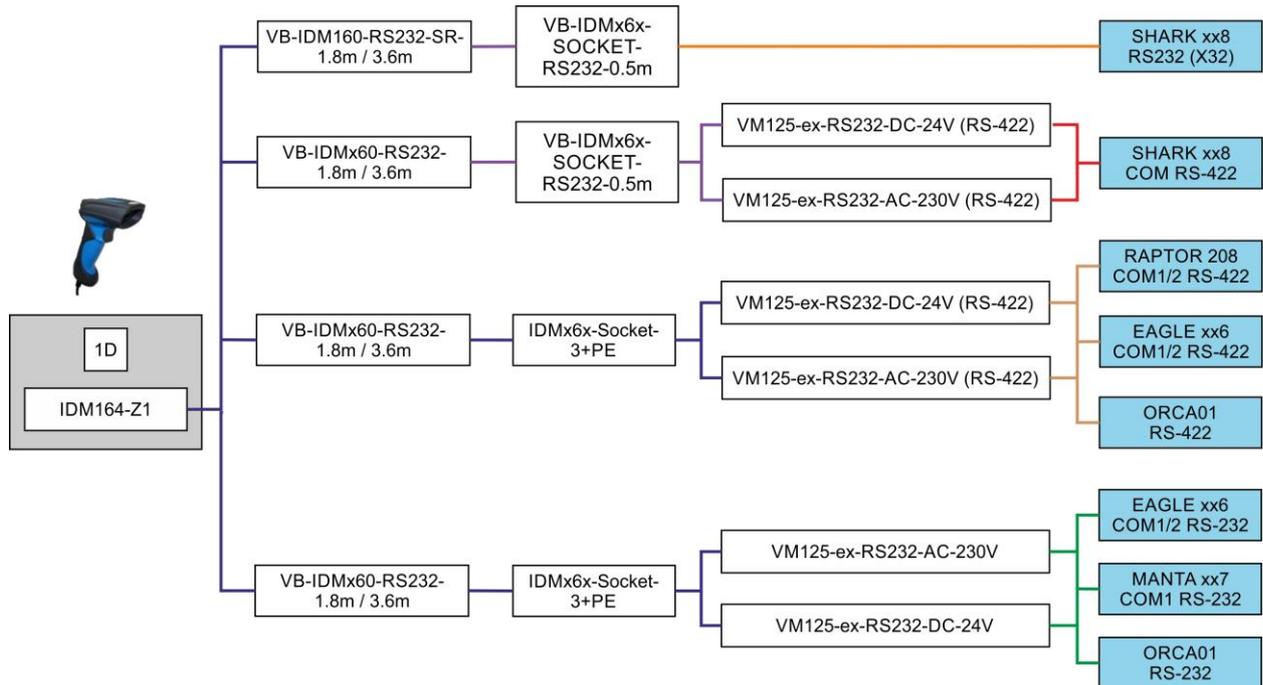
4.1.1 Overview supply modules

 DANGER	<p>Explosion hazard due to exceeding the electrical parameters ! Non-compliance may result in fatal or serious injuries.</p> <ul style="list-style-type: none"> In explosion group IIC, do not use the IDM264-Z1 handheld barcode scanner with the VM125-ex-*-600mA supply module.
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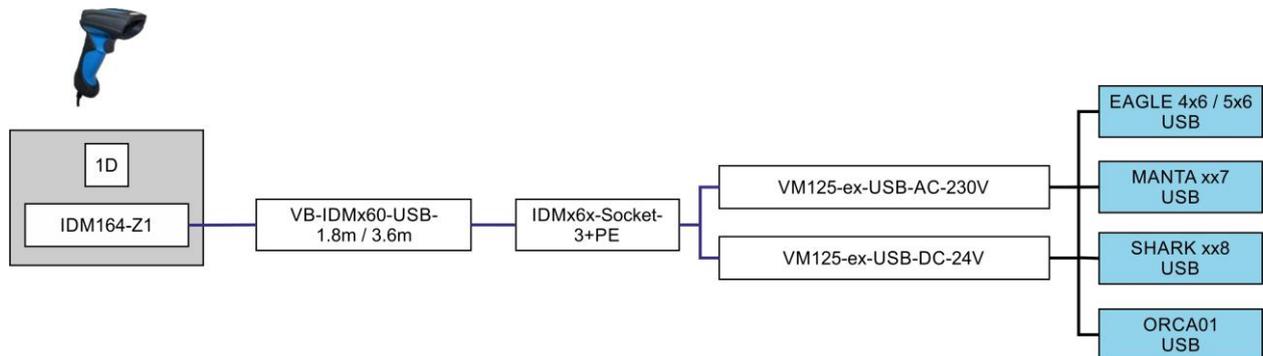
Supply modules	Compatible handheld scanners	Interface			Power supply	
		RS-232	RS-422	USB	AC	DC
VM125-ex-RS232-AC-230V	IDM164-Z1	✓	✓	✗	✓	✗
VM125-ex-RS232-DC-24V	IDM164-Z1	✓	✓	✗	✗	✓
VM125-ex-USB-AC-230V	IDM164-Z1	✗	✗	✓	✓	
VM125-ex-USB-DC-24-V	IDM164-Z1	✗	✗	✓	✗	✓
VM125-ex-RS232-AC-230V-600mA	IDM264-Z1	✓	✓	✗	✓	✗
VM125-ex-RS232-DC-24V-600mA	IDM264-Z1	✓	✓	✗	✗	✓
VM125-ex-USB-AC-230V-600mA	IDM264-Z1	✗	✗	✓	✓	✗
VM125-ex-USB-DC-24V-600mA	IDM264-Z1	✗	✗	✓	✗	✓

4.1.2 Connection overview VM125-ex for handheld barcode scanner

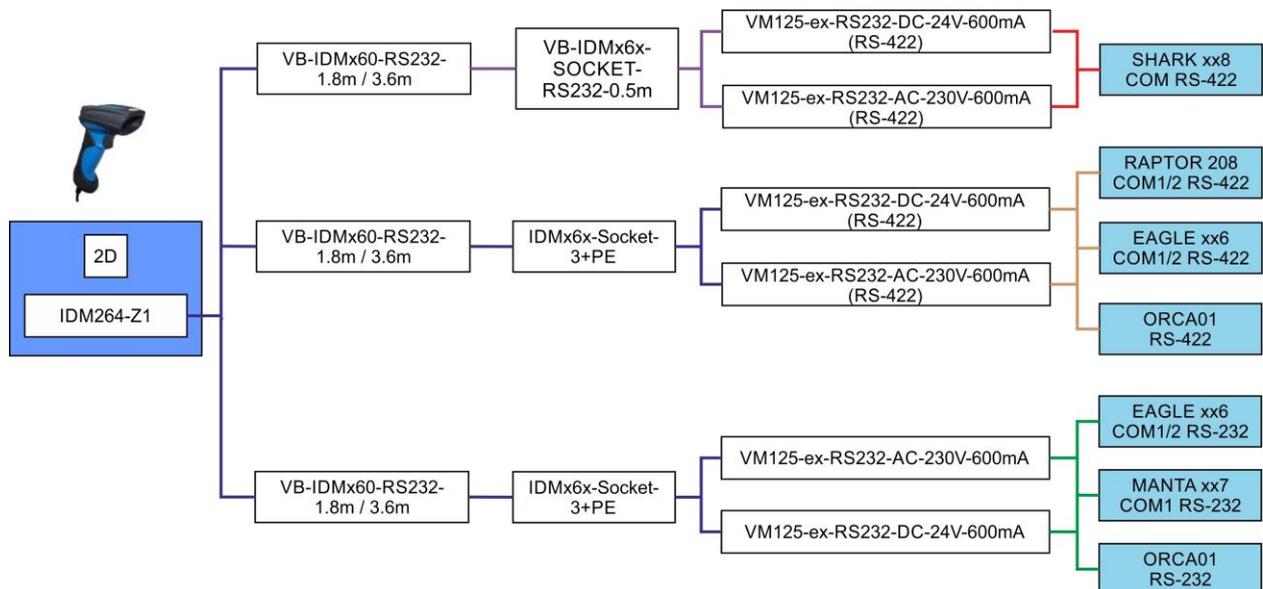
4.1.2.1 VM125-ex connection RS-xxx for handheld barcode scanner IDM164-Z1



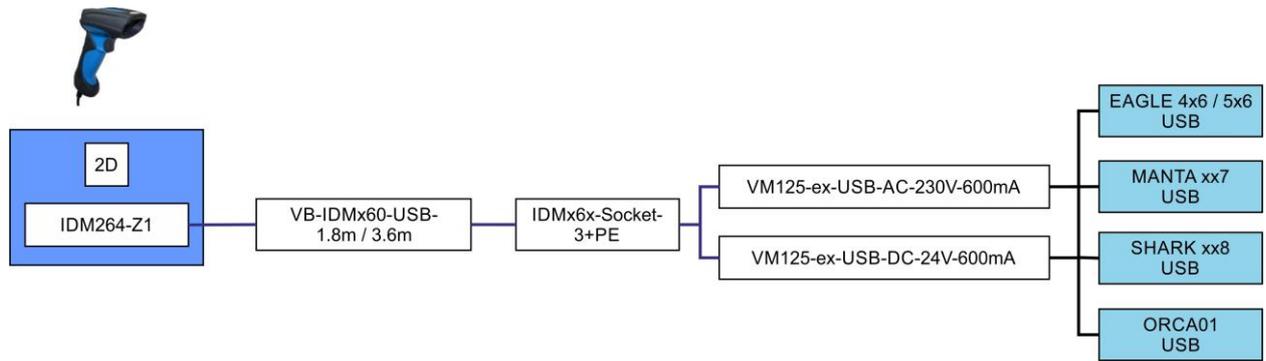
4.1.2.2 VM125-ex connection USB for handheld barcode scanner IDM164-Z1



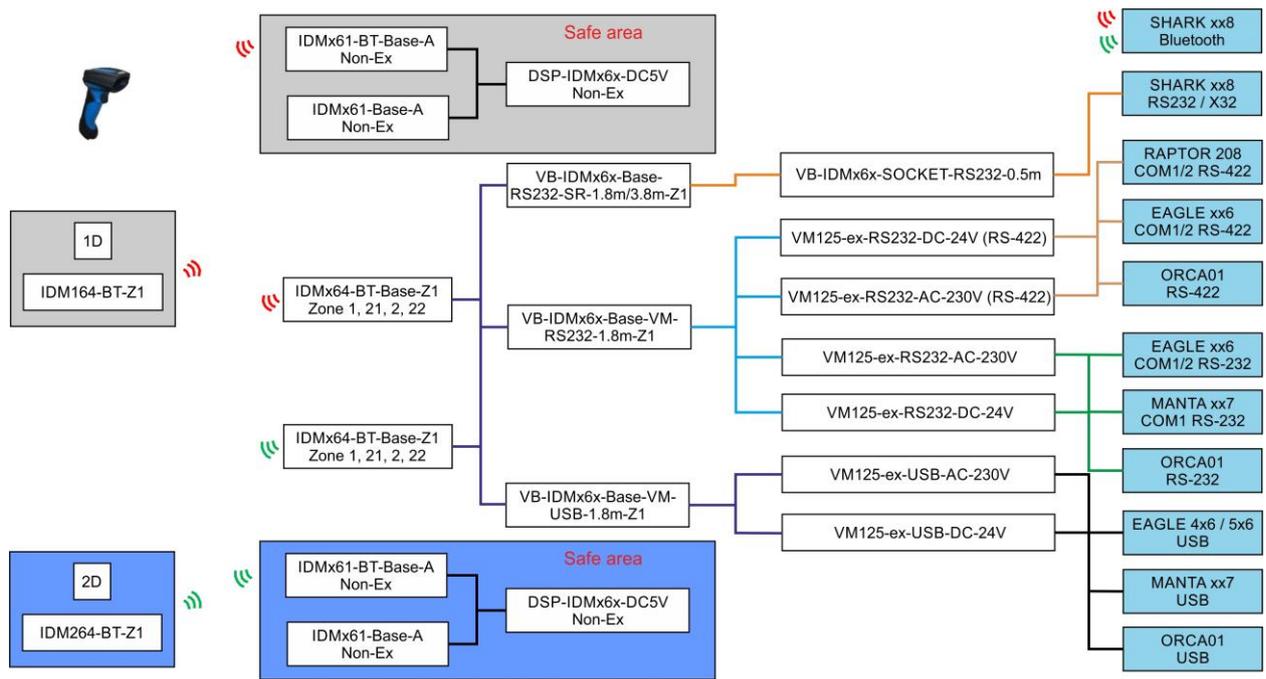
4.1.2.3 VM125-ex connection RS-xxx for handheld barcode scanner IDM264-Z1



4.1.2.4 VM125-ex connection USB for handheld barcode scanner IDM264-Z1



4.1.3 Connection overview VM125-ex for Bluetooth barcode scanner



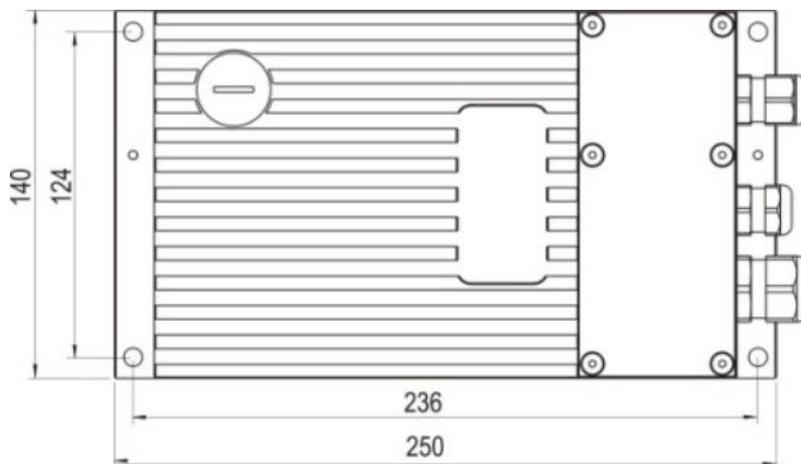
4.2 Device design



Item	Designation
1	Enclosure (permanently closed - do not open)
2	Cover of connection compartment
3	Breather
4	Screw plug (do not unscrew)

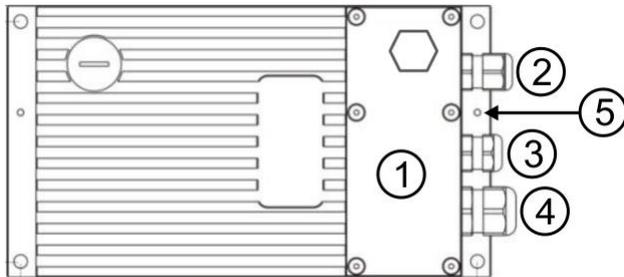
4.3 Dimensions

Dimensions: 140 mm x 250 mm x 56 mm



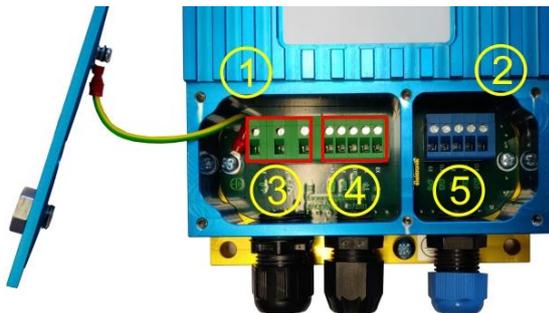
4.4 Connection compartment

4.4.1 Cable connection



Item	Designation cable connection
1	Cover of connection compartment
2	Cable bushing scanner (cable gland M16 x 1.5)
3	Cable bushing data transmission (cable gland M16 x 1.5)
4	Cable bushing power supply (cable gland M20 x 1.5)
5	Connection equipotential bonding (M5 x 10)

4.4.2 Terminal compartment



Item	Designation terminal compartment
1	Ex e terminal compartment
2	Ex i terminal compartment
3	Terminals for power supply
4	Terminals for data transmission
5	Terminals for scanner

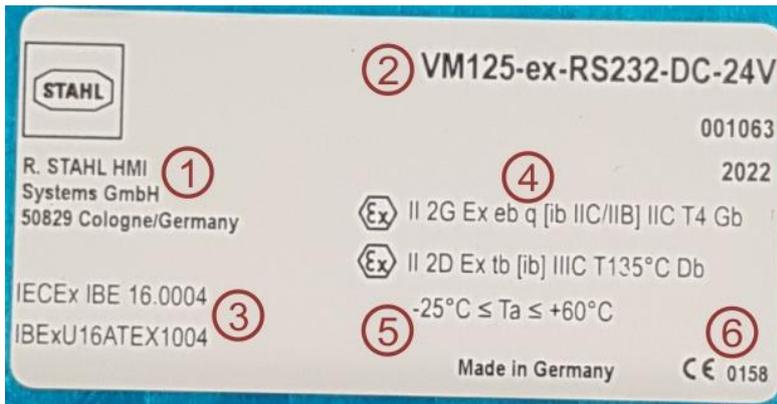
4.5 Markings on the device

4.5.1 Position



Item	Designation	Text
1	Type label	-
2	Warning notice "Power supply"	ATTENTION ! Do not open under voltage
3	Warning notice "Enclosure sealed"	This enclosure is factory sealed. Do not open!

4.5.2 Design of a type label



Item	Designation
1	Address of the manufacturer
2	Version of the VM125-ex type
3	Certificate numbers
4	Ex marking ATEX / IECEx
5	Approval ambient temperature
6	CE marking

4.5.3 Type key code

VM125-ex-aa-bb-cc

Position in type key	Possible value	Description
VM125-ex		Supply module for Zone 1, 2 and 21, 22 for barcode scanner
-	-	Hyphen
aa	RS232	RS-232 / RS-422 interface
	USB	USB interface
-	-	Hyphen
bb	AC-230V	230 VAC input voltage
	DC-24V	24 VDC input voltage
-	-	Hyphen
cc	600mA	Supply module version for 2D barcode scanner

Version:

Produkt versions	Description
VM125-ex-RS232-DC-24V	Supply module with RS-232 / RS-422 interface and 24 VDC input voltage
VM125-ex-RS232-AC-230V	Supply module with RS-232 / RS-422 interface and 230 VAC input voltage
VM125-ex-RS232-DC-24V-600mA	Supply module with RS-232 / RS-422 interface and 24 VDC input voltage, for 2D barcode scanner
VM125-ex-RS232-AC-230V-600mA	Supply module with RS-232 / RS-422 interface and 230 VAC input voltage, for 2D barcode scanner
VM125-ex-USB-DC-24V	Supply module with USB interface and 24 VDC input voltage
VM125-ex-USB-AC-230V	Supply module with USB interface and 230 VAC input voltage
VM125-ex-USB-DC-24V-600mA	Supply module with USB interface and 24 VDC input voltage, for 2D barcode scanner
VM125-ex-USB-AC-230V-600mA	Supply module with USB interface and 230 VAC input voltage, for 2D barcode scanner

4.5.4 Ex classification ATEX / IECEx

Ex marking ATEX / IECEx according to IEC 60079-0 and ATEX directive 2014/34/EU.

Version	2014/34/EU prefix	Ex marking
Gas	 II 2 G	Ex eb q [ib IIC/IIB] IIC T4 Gb
Dust	 II 2 D	Ex tb [ib] IIIC T135°C Db

5 Transport and storage

NOTE	<p>No or damaged packaging during transport and storage Non-observance can cause property damage. If the device is transported or stored without packaging, shocks, vibrations, pressure and humidity can directly impact the device. Damaged packaging indicates that the device has been subjected to and possibly been damaged by outside influences. This may result in faulty functionality.</p> <ul style="list-style-type: none">• Transport and store the device in undamaged packaging, ideally the original packaging.• Observe measures for professional transport and storage.
-------------	--

Transport

- Check the state of the packaging.
- Report any damage sustained in transport to the haulier responsible and have it confirmed.
- Do not drop the device.

Storage

- Ensure specified storage temperature range is not exceeded (see chapter [3.1 Intended use](#)).
- Store the device in a dry place free of vibrations.

6 Unpacking

- Unpack the device at its final destination.
- Compare the contents of the packaging with the delivery note and check for completeness and damage.
- Contact the manufacturer if the contents are incomplete, damaged or not what you have ordered.
- Dispose of the packaging materials according to local regulations.

7 Mounting and installation

7.1 Note on mounting and installation

- Observing the following points will ensure a professional and safe assembly and installation:
- Mount the device carefully and strictly in accordance with the safety notes (see chapter [3 Safety and security](#)).
- Study the installation conditions and assembly instructions in these operating instructions carefully and follow them to the letter.

7.2 Requirements for site of installation

- Install and set up the device so that it is operated within the permissible temperature range.
- For outdoor operation, the VM125-ex-* supply module must be installed in an appropriate enclosure with at least IP65 protection.

7.3 Mounting and installing the device

 DANGER	<p>Explosion hazard due to improper installation ! Non-compliance may result in fatal or serious injuries.</p> <ul style="list-style-type: none"> • Ensure the atmosphere is non-explosive. • Make sure that the device is not damaged. • If the device is connected to the mains: <ul style="list-style-type: none"> ○ Disconnect the device from the power supply. ○ Switch off the input voltage before opening the terminal compartment.
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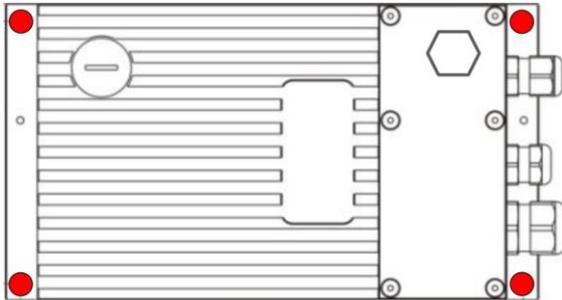
 DANGER	<p>Explosion hazard due to unsealed terminal compartment ! Non-compliance may result in fatal or serious injuries.</p> <ul style="list-style-type: none"> • Before putting the device into operation in a potentially explosive atmosphere, make sure that the terminal compartment has been completely closed again and screwed down properly, including the flat seal.
---	--

NOTE	<p>Damage of the device due to improper installation ! Non-observance will result in damage and malfunction of the internal components.</p> <ul style="list-style-type: none"> • Ensure that there is equipotential bonding throughout the installation of the intrinsically safe circuits.
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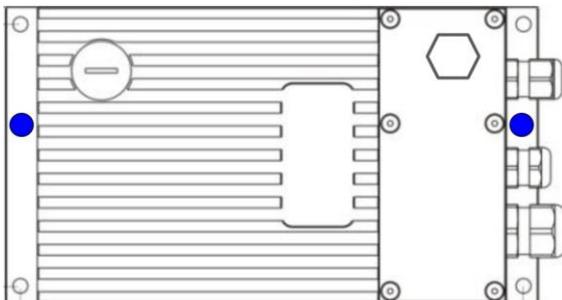
NOTE	<p>Damage of the device due to improper handling ! Non-observance will result in damage and malfunction of the internal components.</p> <ul style="list-style-type: none"> • Do not open terminal compartments in potentially explosive atmospheres. • Do not open the enclosure.
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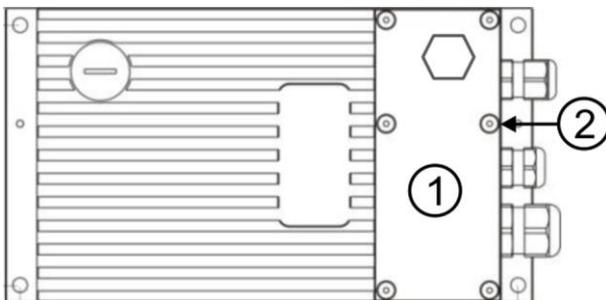
Position of the connections, see chapter [4.4 Connection compartment](#).
 Information on terminal assignment, see chapter [14.1 Connection overview terminal assignment](#).



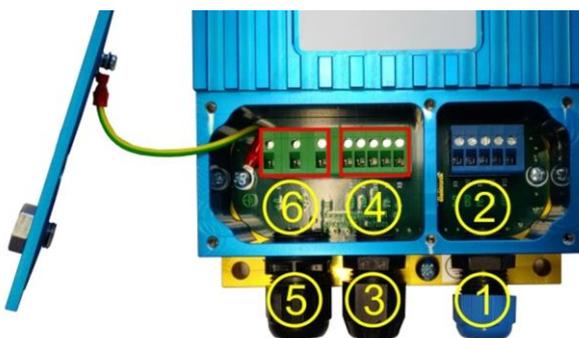
- Mount the base plate with 4 mounting holes \varnothing 7 mm (red markings) on a secure surface.



- Connect the potential connection (M5 x 10 mm) (blue markings) and integrate it into the equipotential bonding of the system.
 Preferably use the potential connection on the side of the cable glands.



- Open the connection compartment (1) by loosening the 6 cover screws (2).



- Pull the connection cable to the scanner or the base charging station through the cable gland (1).
- Place the cable cores on the terminals (2).
- Tighten the cable gland (1).
- Pull the connection cable for data transmission through the cable gland (3).
- Place the cable cores on the terminals (4).
- Tighten the cable gland (3).
- Pull the connection cable for the power supply through the cable gland (5).
- Place the cable cores on the terminals (6).
- Tighten the cable gland (5).



- Close the connection compartment.
- Ensure that the flat seal is seated correctly.
- Tighten the 6 cover screws.

7.4 Disassembling the device



Switch off power supply !

Disassembly is carried out in reverse order to assembly.

8 Operation

**Hot surfaces !**

Non-compliance may result in minor burns.

In ambient temperatures exceeding +45 °C the surface of the device may heat up.

- Do not touch the device.

9 Maintenance, overhaul and repair

 DANGER	<p>Explosion hazard due to damaged seal ! Non-compliance may result in fatal or serious injuries !</p> <ul style="list-style-type: none"> • In case of damage or changes to the factory state immediately decommission the device. • Contact manufacturer.
---	---

 DANGER	<p>Explosion hazard due to incorrect maintenance or repair ! Non-compliance may result in fatal or serious injuries !</p> <ul style="list-style-type: none"> • Ensure the atmosphere is non-explosive. • Make sure that the device is not damaged. • Do not open the enclosure. • If the device is connected to the mains: <ul style="list-style-type: none"> ○ Disconnect the device from the power supply. ○ Switch off the input voltage before opening the terminal compartment.
---	--

 WARNING 	<p>Hot surfaces ! Non-compliance may result in minor burns. In ambient temperatures exceeding +45 °C the surface of the device may heat up.</p> <ul style="list-style-type: none"> • Do not touch the device.
--	---

The operator must have an electrically operated device in a potentially explosive atmosphere checked for proper condition by a qualified electrician.

	<p>Comply with the regulations applicable to the maintenance, servicing and testing of associated equipment in accordance with Directive 1999/92/EC, IEC/EN 60079-19, IEC/EN 60079-17 and BetrSichVer.</p>
---	--

9.1 Maintenance

During maintenance work, check the following points in addition to the national rules:

- Damage to the seals: Cracking and other visible damage to the device enclosure and / or protective enclosure.
- All cables and wires firmly connected: Tight fit of the under-clamped wires
- All cables and wires undamaged
- Adherence to the permissible temperatures
- Firm seat of the fastenings, all screws tightened firmly
- Ensure the intended use

9.2 Overhaul

The devices are maintenance-free across their entire lifespan.

9.3 Repair

Repairs may only be carried out by the manufacturer or by persons authorised and trained for this purpose by the manufacturer.

10 Returning the device

Only return or package the devices after consulting R. STAHL. Contact the responsible representative from R. STAHL. R. STAHL's customer service is available to handle returns if repair or service is required.

Contact customer service via E-mail or telephone:

- E: service.dehm@r-stahl.com
- T: +49 221 76806 3000

Requesting a RMA ticket via our website:

- Go to r-stahl.com.
- Under "Support" > "RMA form", select "Request RMA ticket".
- Fill in and send the form.
- You will automatically receive an E-mail with an RMA ticket (PDF).
- Print out the RMA ticket.
- Clearly copy the RMA number onto the outside of the package.
- Send the device with the RMA ticket included in the package to R. STAHL HMI Systems GmbH (see chapter [1.1 Manufacturer](#) for the address).

11 Cleaning

- Check the device for damage before and after cleaning it. Decommission damaged devices immediately.
- Devices located in hazardous areas may only be cleaned with a damp cloth to avoid electrostatic charge.
- When cleaning with a damp cloth, use water or mild, non-abrasive, non-scratching cleaning agents.
- Do not use abrasive detergents or solvents.
- Never clean the device with a strong water jet, such as a pressure washer.

12 Accessories

NOTE

Malfunction or damage to the device due to the use of non-original components.

Non-compliance may result in material damage !

- Only use original manufacturer accessories.

13 Appendix A

13.1 Technical data

Function / Equipment	VM125-ex-*
Enclosure	Aluminium enclosure
Degree of protection (IP)	IP64
Operating temperature range	
Operation	-25 °C ... +60 °C
Storage temperature	-40 °C ... +60 °C
Mounting orientation	any
Dimensions (W x H x D)	140 mm x 250 mm x 56 mm
Weight	3.1 kg

13.1.1 Electrical data

Function / Equipment	VM125-ex-*
Connection compartment	All connections directly integrated in Ex e or Ex i connection compartment
Connections	via screw terminals (green) Ex e / (blue) Ex i
Power supply cable	1.5 to 2.5 mm ² (AWG16 to AWG14) 3-wire
Cable notice	Observe the current carrying capacity of the connecting cable.

Function / Equipment	VM125-ex- RS232-AC- 230V	VM125-ex- RS232-DC- 24V	VM125-ex- USB-AC- 230V	VM125-ex- USB-DC- 24V
Interfaces	RS-232 / RS-422		USB	
Power supply				
Rated operational voltage AC	230 V	–	230 V	–
Voltage range AC	90 – 253 V	–	90 – 253 V	–
Rated operational voltage DC	–	24 V	–	24 V
Voltage range DC	–	18 – 30 V	–	18 – 30 V
Rated operational power	ca. 4 W (max. 16 W)	ca. 3,7 W (max. 7.1 W)	ca. 4 W (max. 16 W)	ca. 3.7 W (max. 7.1 W)
Frequency range	50 – 60 Hz	–	50 – 60 Hz	–
Data cable	0.2 – 2.5 mm ² (AWG24 to AWG14) 4-wire		0.2 – 2.5 mm ² (AWG24 to AWG14), 3-wire	
Data cable length	max. 15 m / 1000 m		max. 5 m	

Function / Equipment	VM125-ex- RS232-AC- 230V-600mA	VM125-ex- RS232-DC- 24V-600mA	VM125-ex- USB-AC- 230V-600mA	VM125-ex- USB-DC- 24V-600mA
Scanner types	for 2D handheld barcode scanner IDM264-Z1			
Interfaces	RS-232 / RS-422		USB	
Power supply				
Rated operational voltage AC	230 V	–	230 V	–
Voltage range AC	90 – 253 V	–	90 – 253 V	–
Rated operational voltage DC	–	24 V	–	24 V
Voltage range DC	–	18 – 30 V	–	18 – 30 V
Rated operational power	ca. 4 W (max. 16 W)	ca. 3,7 W (max. 7.1 W)	ca. 4 W (max. 16 W)	ca. 3.7 W (max. 7.1 W)
Frequency range	50 – 60 Hz	–	50 – 60 Hz	–
Data cable	0.2 – 2.5 mm ² (AWG24 to AWG14) 4-wire		0.2 – 2.5 mm ² (AWG24 to AWG14), 3-wire	
Data cable length	max. 15 m / 1000 m		max. 5 m	

14 Appendix B

14.1 Connection overview terminal assignment



Changes to the wiring may only be carried out by instructed specialist personnel.
All GND and shield contacts are internally connected to PE.

Data cable:

USB: 0.2 – 2.5 mm², 3-wire

RS232 / RS422: 0.2 – 2.5 mm², 4-wire

Power supply cable: 1.5 – 2.5 mm², 3-wire

14.1.1 Ex e terminal compartment - terminals

14.1.1.1 VM125-ex-RS232-*

Terminal number	Terminal definition	Function	Description
X1	+ / L	+ = 24 VDC L = 90 – 253 VAC	Input voltage, DC or AC
X2	- / N	- = 0 VDC N = 90 – 253 VAC	Input voltage, DC or AC
X3	PE	PE	Protective conductor
X4	GND	RS-232	RS-232 ground
X5	TxD	RS-232	RS-232 TxD
X6	Screen	RS-232/422	Screen RS-232/422
X7	T+	RS-422	RS-422 T+ wire
X8	T-	RS-422	RS-422 T- wire



With the RS-232 / RS-422 interfaces, only the transmitters are equipped.
Therefore, only the transmitters ("Transmit") data wires are available.

14.1.1.2 VM125-ex-USB-*

Terminal number	Terminal definition	Function	Description
X1	+ / L	+ = 24 VDC L = 90 – 253 VAC	Input voltage, DC or AC
X2	- / N	- = 0 VDC N = 90 – 253 VAC	Input voltage, DC or AC
X3	PE	PE	Protective conductor
X4	GND	USB	USB ground
X5	Screen	USB	USB VCC
X6	NC	–	Not used
X7	D+	USB	USB +
X8	D-	USB	USB -



Only terminals X4 (GND), X7 (D+) and X8 (D-) are required for the USB connection.

14.1.2 Ex i terminal compartment - terminals

14.1.2.1 VM125-ex-RS232-*

Terminal number	Terminal definition	Function	Description	With pre-assembled connection coupling	
				Pin	Wire
X9	RxD	Receiving wire	TxD from scanner	3	3
X10	GND	–	Not used	–	–
X11	PE	–	Not used	–	–
X12	GND	Ground	Ground scanner	2	2
X13	+UB	Supply wire +	+ UB scanner	1	1

14.1.2.2 VM125-ex-USB-*

Terminal number	Terminal definition	Function	Description	With pre-assembled connection coupling	
				Pin	Wire
X9	D+	USB	USB +	3	3
X10	D-	USB	USB -	2	4
X11	PE	PE	Not used	–	–
X12	GND	Ground	Ground scanner	4	2
X13	+UB	Supply wire +	+ UB scanner	1	1

15 Appendix C

15.1 Safety-related data

15.1.1 Non-intrinsically safe supply circuit

15.1.1.1 VM125-ex*-DC-*

Power supply	U	= +24 VDC \pm 25 %
	U _m	= 253 VAC
Power consumption	P	= ca. 3.7 W (max. 7.1 W)

15.1.1.2 VM125-ex*-AC-*

Power supply	U	= 90 VAC to 253 VAC, 50 – 60 Hz
	U _m	= 253 VAC
Power consumption	P	= ca. 4 W (max. 16 W)

15.1.2 Non-intrinsically safe data circuit

15.1.2.1 VM125-ex-RS232-*

Data circuit RS-232		= \pm 12 VDC / 4 mA
Data circuit RS-422		= +12 VDC / -7 VDC / 4 mA
	U _m	= 253 VAC

15.1.2.2 VM125-ex-USB-*

Data circuit		= +5 VDC / 68 mA
	U _m	= 253 VAC

15.1.3 Intrinsically safe circuit

15.1.3.1 VM125-ex-RS232-*

...-DC-24V / ...-AC-230V

with RS-232 / RS-422 interface, 4.9 V, output current 240 mA:

U _o	=	4,9 V
I _o	=	440 mA
P _o	=	1.17 W (trapezoidal characteristic)
R _i	=	25 Ω
C _i	=	2.2 μ F
C _o		if L _o negligible
Ex ib IIB	=	1000 μ F
Ex ib IIC	=	113 μ F
L _o	=	if C _o negligible
Ex ib IIB	=	1.3 mH
Ex ib IIC	=	0.1 mH

...-DC-24V-600mA / ...-AC-230V-600mA
with RS-232 / RS-422 interface, 5.3 V, output current 420 mA:

U_o	=	5.3 V
I_o	=	1125 mA
P_o	=	3.16 W (trapezoidal characteristic)
R_i	=	10 Ω
C_i	=	2.2 μ F
C_o		if L_o negligible
Ex ib IIB	=	1000 μ F
Ex ib IIC	=	68 μ F
L_o	=	if C_o negligible
Ex ib IIB	=	0.2 mH
Ex ib IIC	=	0.06 mH

15.1.3.2 VM125-ex-USB-*

... -DC-24V / ...-AC-230V:

U_o	=	4.9 V
I_o	=	440 mA
P_o	=	1.17 W (trapezoidal characteristic)
R_i	=	25 Ω
C_i	=	2.2 μ F
C_o		if L_o negligible
Ex ib IIB	=	1000 μ F
Ex ib IIC	=	113 μ F
L_o	=	if C_o negligible
Ex ib IIB	=	0.53 mH
Ex ib IIC	=	0.1 mH

Data circuit

U_o	=	4.9 V
I_o	=	40 mA
P_o	=	48 mW (linear characteristic)
R_i	=	246 Ω
C_i	=	1.2 μ F
C_o	=	if L_o negligible
Ex ib IIB	=	1000 μ F
Ex ib IIC	=	113 μ F
L_o	=	if C_o negligible
Ex ib IIB	=	0.53 mH
Ex ib IIC	=	0.1 mH

...-DC-24V-600mA / ...-AC-230V-600mA:

U_o	=	5.3 V
I_o	=	1125 mA
P_o	=	3.16 W (trapezoidal characteristic)
R_i	=	10 Ω
C_i	=	2.2 μ F
C_o	=	if L_o negligible
Ex ib IIB	=	1000 μ F
Ex ib IIC	=	67 μ F
L_o	=	if C_o negligible
Ex ib IIB	=	0.2 mH
Ex ib IIC	=	0.06 mH

Data circuit

U_o	=	4.9 V
I_o	=	40 mA
P_o	=	48 mW (linear characteristic)
R_i	=	246 Ω
C_i	=	1.2 μ F
C_o	=	if L_o negligible
Ex ib IIB	=	1000 μ F
Ex ib IIC	=	67 μ F
L_o	=	if C_o negligible
Ex ib IIB	=	0.2 mH
Ex ib IIC	=	0.06 mH

16 Appendix D

16.1 Proof of intrinsic safety

Proof of intrinsic safety for connection of barcode scanner with supply modules type VM125-ex-* and the HMI devices ET-/MT-xx8 device platform SHARK.

16.1.1 Generell

Proof of intrinsic safety is given on the basis of the IEC/EN 60079-14 and the standards referred to therein. In particular, we refer to Chapter 12 "Additional requirements for type of protection i - intrinsic safety" in IEC/EN 60079-14.

Proof has been produced on the basis of the Certificate of Conformity according to IEC/EN 60079-0 and IEC/EN 60079-11 or the EC Type Examination Certificate according to the 2014/34/EU directive and the comparison of the safety-relevant data listed therein.

The following Type Examination Certificates were used:

Device		Type Examination Certificate
IDM164-Z1 and IDM264-Z1	—	IBExU16ATEX1002
IDM164-BT-Z1 and IDM264-BT-Z1	—	IBExU16ATEX1003
VM125-ex-*	—	IBExU16ATEX1004
SHARK (ET-/MT-xx8)	—	BVS 14 ATEX E 134 X

The relevant test body has listed **all** conditions applicable to intrinsic safety in the type examination certificates.

For example, if a type examination certificate for a specific device only lists the applicable voltage (U_i), this means that intrinsic safety is guaranteed for connections if the associated supply module does not exceed this voltage level (U_o is smaller than / equal to U_i).

Other output parameters defined in the test certificate of the power supply device (e.g. I_o , P_o) are irrelevant to intrinsic safety concerns.



The data listed in this document **DO NOT** absolve the installers / operators of each system from their duty and responsibility to observe the applicable statutory requirements, directives and regulations. In any case, the associated due diligence remains the responsibility of the installer and / or the operator !

16.1.2 Connections

Examination of the voltage, current, capacitance and inductance values of all circuits to establish the connection between the barcode scanner with a standard cable length of 1.8 m or 3.6 m and the supply modules or the HMI device.

 DANGER	<p>Explosion hazard due to exceeding the electrical parameters ! Non-compliance may result in fatal or serious injuries.</p> <ul style="list-style-type: none"> Do not use the extension cable VB-IDM160-EXT-* when connecting the barcode handheld scanners or the base loading stations to the SHARK device platform (ET-/MT-xx8). Only use a maximum cable extension of 1 m.
---	---

If the standard cable is extended on the installer's and / or operator's own responsibility, the respective additional C and L cable values must be taken into account in the interconnection to prove intrinsic safety.

	<p>At this point, we expressly point out that we cannot make any statements regarding the functionality of this cable extension.</p>
---	--

16.1.2.1 Handheld barcode scanner

a) VM125-ex-RS232-* with IDM164-Z1

Source / active	==>	Sink / passive
VM125-ex-RS232-*	VB-IDMx60-RS232-x.xm	IDM164-Z1
Connection Ex i		Scanner connection
U _o = 4.9 VDC	≤	U _i = 4.9 VDC
I _o = 440 mA	≤	I _i = 480 mA
P _o = 1.17 W	≤	P _i = 1.25 W
Co[μF] IIC = 113	≥	Ci = 112.4 μF
Lo[mH] IIC = 0.1	≥	Li = negligible
Co[μF] IIB = 1000	≥	Ci = 112.4 μF
Lo[mH] IIB = 1.3	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.

b) VM125-ex-USB-* with IDM164-Z1

Source / active		==>	Sink / passive
VM125-ex-USB-*		VB-IDMx60-USB-x.xm	IDM164-Z1
Connection Ex i			Scanner connection
U _o = 4.9 VDC		≤	U _i = 4.9 VDC
I _o = 440 mA		≤	I _i = 480 mA
P _o = 1.17 W		≤	P _i = 1.25 W
Co[μF] IIC =	113	≥	Ci = 112.4 μF
Lo[mH] IIC =	0.1	≥	Li = negligible
Co[μF] IIB =	1000	≥	Ci = 112.4 μF
Lo[mH] IIB =	0.53	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.

c) VM125-ex-RS232-* -600mA with IDM264-Z1

Source / active		==>	Sink / passive
VM125-ex-RS232-* -600mA		VB-IDMx60-RS232-x.xm	IDM264-Z1
Connection Ex i			Scanner connection
U _o = 4.9 VDC		≤	U _i = 5.6 VDC
I _o = 710 mA		≤	I _i = 1140 mA
P _o = 1.95 W		≤	P _i = 4.5 W
Co[μF] =	1000 bei IIB	≥	Ci = 869 μF
Lo[mH] =	0.2	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.



Explosion hazard due to exceeding the electrical parameters !

Non-compliance may result in fatal or serious injuries.

- In explosion group IIC, do not use the IDM264-Z1 handheld barcode scanner with the VM125-ex-* -600mA supply module.

d) ET-/MT-xx8 RS232 (X32) with IDM164-Z1

Source / active		==>	Sink / passive
ET-/MT-xx8 RS232 (X32)		VB-IDM160-RS232-SR-x.xml	IDM164-Z1
Connection X32			Scanner connection
U _o = 5.36 VDC		≤	U _i = 5.6 VDC
I _o = 436 mA		≤	I _i = 480 mA
P _o = 1.235 W		≤	P _i = 1.25 W
Co[μF] =	65	≥	Ci = 46 μF
Lo[μH] =	1	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.

16.1.2.2 Bluetooth barcode scanner

a) VM125-ex-RS232-* with IDM164-BT-Z1 or IDM264-BT-Z1

Source / active		==>	Sink / passive
VM125-ex-RS232-*		VB-IDMx6x-Base-VM-RS232-1.8m-Z1	IDMx64-BT-Base-Z1
Connection Ex i			Baseloading station connection
U _o = 4.9 VDC		≤	U _i = 5.5 VDC
I _o = 440 mA		≤	I _i = 480 mA
P _o = 1.17 W		≤	P _i = 1.25 W
Co[μF] IIB =	1000	≥	Ci = 190.3 μF
Lo[mH] IIB =	1.3	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.

 DANGER	<p>Explosion hazard due to exceeding the electrical parameters !</p> <p>Non-compliance may result in fatal or serious injuries.</p> <ul style="list-style-type: none"> In explosion group IIC, do not use the IDM264-Z1 handheld barcode scanner with the VM125-ex-*-600mA supply module.
---	---

b) VM125-ex-USB-* with IDM164-BT-Z1 or IDM264-BT-Z1

Source / active		==>	Sink / passive
VM125-ex-USB-*		VB-IDMx6x-Base-VM-USB-1.8m-Z1	IDMx64-BT-Base-Z1
Connection Ex i			Baseloading station connection
U _o = 4.9 VDC		≤	U _i = 5.5 VDC
I _o = 440 mA		≤	I _i = 480 mA
P _o = 1.17 W		≤	P _i = 1.25 W
Co[μF] IIB =	1000	≥	Ci = 190.3 μF
Lo[mH] IIB =	0.53	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.

 DANGER	<p>Explosion hazard due to exceeding the electrical parameters !</p> <p>Non-compliance may result in fatal or serious injuries.</p> <ul style="list-style-type: none"> In explosion group IIC, do not use the IDM264-Z1 handheld barcode scanner with the VM125-ex-*-600mA supply module.
---	---

c) ET-/MT-xx8 RS232 (X32) with IDM164-BT-Z1 or IDM264-BT-Z1

Source / active		==>	Sink / passive
ET-/MT-xx8 RS232 (X32)		VB-IDMx6x-Base-RS232-SR-x.xm-Z1	IDMx61-BT-Base-Z1
Connection X32			Baseloading station connection
U _o = 5.36 VDC		≤	U _i = 5.6 VDC
I _o = 436 mA		≤	I _i = 480 mA
P _o = 1.235 W		≤	P _i = 1.25 W
Co[μF] =	65	≥	Ci = 46 μF
Lo[μH] =	1	≥	Li = negligible

C_o and L_o pairs directly above / underneath each other may be used.

17 Appendix E

17.1 Disposal / Restricted substances

Disposal of old electric and electronic devices, packaging and used parts is subject to regulations valid in whichever country the device has been installed.

For countries under the jurisdiction of the EU the corresponding WEEE directive applies.

The devices are classified according to the table below:

Directive	WEEE II directive 2012/19/EU
Valid	from 2018-08-15
Category	SG6, Small IT and telecommunication equipment <50 cm

R. STAHL HMI Systems GmbH meets the requirements of directive 2012/19/EU (WEEE) and is registered under the number DE 15180083.

We shall take back our devices according to our General Terms and Conditions.

17.1.1 Declaration of substances and restricted substances

The present declaration is based on the procedure described in the international standard and directives as listed in the table below:

- IEC 62474 : 2018 (DIN EN IEC 62474 : 2019-09)
- (EG) Nr. 1907/2006 (REACH)
- Directive 2011/65/EU (RoHS)

17.1.1.1 Declarable substance groups

Component	Name	Mass (g)	Declarable Substance Groups and Substances (IEC 62474 database)	CAS No.	Mass %	Exemption (acc. to directive)
-	-	-	No SVHC present	-	-	-

17.1.1.2 RoHS directive 2011/65/EC

The devices meet the requirements of RoHS Directive 2011/65/EU.

18 Appendix F

18.1 Declaration of conformity

18.1.1 EU

EU Konformitätserklärung EU Declaration of Conformity Déclaration de Conformité UE



R. STAHL HMI Systems GmbH • Adolf-Grimme-Allee 8 • 50829 Köln, Germany
erklärt in alleiniger Verantwortung, declares in ist sole responsibility, déclare sous sa seule responsabilité,

dass das Produkt: **Versorgungsmodul**
that the product: **Supply Module**
que le produit: **Module d'alimentation**

Typ(en), type(s), type(s): **VM125-ex-***

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) / Directive(s) / Directive(s)	Norm(en) / Standard(s) / Norme(s)
2014/34/EU ATEX-Richtlinie 2014/34/EU ATEX Directive 2014/34/UE Directive ATEX Official Journal of the EU L96, 29/03/2014, p. 309–356	EN IEC 60079-0:2018 EN 60079-5:2015 EN 60079-7:2015/A1:2018 EN 60079-11:2012 EN 60079-31:2014
Kennzeichnung, marking, marquage:	II 2G Ex eb q [ib IIC/IIb] T4 Gb II 2D Ex tb [ib] IIIC T135°C Db CE0158
EU Baumusterprüfbescheinigung: EU Type Examination Certificate: Attestation d'examen UE de type:	IBExU 16ATEX1004 (IBExU Institut für Sicherheitstechnik GmbH Fuchsmühlenweg 7, 09599 Freiberg, Germany NB 0637)
2014/35/EU Niederspannungsrichtlinie: 2014/35/EU Low Voltage Directive: 2014/35/UE Directive Basse Tension: Official Journal of the EU L96, 29/03/2014, p. 357–374	EN 61010-1:2010+A1:2019+A1:2019/AC:2019
2014/30/EU EMV-Richtlinie 2014/30/EU EMC Directive 2014/30/UE Directive CEM Official Journal of the EU L96, 29/03/2014, p. 79–106	EN 61000-6-2:2019 DIN EN 61000-6-4:2020
2011/65/EU RoHS-Richtlinie 2011/65/EU RoHS Directive 2011/65/UE Directive RoHS Official Journal of the EU L174, 1/07/2011, p. 88–110	EN IEC 63000:2018

Für spezifische Merkmale und Bedingungen siehe Betriebsanleitung.
For specific characteristics and conditions see operating instructions.
Pour les caractéristiques et conditions spécifiques, voir le mode d'emploi.

Unterzeichnet für und im Namen von: / signed for and on behalf of: / signé pour et au nom de:
R. STAHL HMI Systems GmbH

Köln, 2023-06-20

i.V.

Alexander Jung
Director R&D

i.V.

Nabil Benighil
Head of Certification

Ort und Datum
Place and date
Lieu et date

19 Appendix G

19.1 Release notes

The chapter entitled "Release Notes" contains all the changes made in every version of the Operating Instructions.

Version 01.02.00

- Removal of older release notes
- Removal general section "Disposal", as contained in "Disposal / Restricted substances".
- Addition of "VM125-ex-USB-*-600mA" versions
- OI amendment with new scanner versions in all sections
- Changing sentence with "for outdoor applications" in section "Improper assembly, installation, commissioning, maintenance or cleaning", for IP protection
- Changing sentence with "for outdoor applications" in section "Requirements for site of installation", for IP protection
- Adaptation of "Summary of applied standards"
- Renew declaration of conformity
- Formal changes

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